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|--|---------------|----------------------|---------------------|------------------|
| APPLICATION NO.  | FILING DATE   | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
| 10/518,286   | 07/05/2005    | Paul R. Routley      | 30740/285906        | 6677             |
| 4743   | 7590          | 12/23/2009           | EXAMINER            |                  |
| MARSHALL, GERSTEIN & BORUN LLP<br>233 SOUTH WACKER DRIVE<br>6300 SEARS TOWER<br>CHICAGO, IL 60606-6357 |               |                      | WALTHALL, ALLISON N |                  |
| ART UNIT   | PAPER NUMBER  |                      |                     |                  |
|  |               | 2629                 |                     |                  |
| MAIL DATE  | DELIVERY MODE |                      |                     |                  |
| 12/23/2009   | PAPER         |                      |                     |                  |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

|                              |                                      |                                       |
|------------------------------|--------------------------------------|---------------------------------------|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/518,286 | <b>Applicant(s)</b><br>ROUTLEY ET AL. |
|                              | <b>Examiner</b><br>ALLISON WALTHALL  | <b>Art Unit</b><br>2629               |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If no period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 10 September 2009.
- 2a) This action is FINAL.      2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1,4,5,8-13 and 20-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) 1,4,5,8-13 and 20-27 is/are allowed.
- 6) Claim(s) 30-34 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO/SB/06)  
 Paper No(s)/Mail Date \_\_\_\_\_
- 4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date \_\_\_\_\_
- 5) Notice of Informal Patent Application  
 6) Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

1. The amendments filed 7/23/2009 and 9/10/2009 have been entered. Claims 1, 4, 5, 8-13, 20-27, and 30-34 are pending.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 32 and 34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 34, the phrase "may be" renders the claim indefinite because it is unclear whether the limitation(s) of the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Regarding claim 32, the phrase "when this will not..." renders the claim indefinite because it is unclear whether "this" is referring to reducing the supply voltage, sensing a voltage on a line, or another preceding limitation of the claim.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 32 and 34 are rejected under 35 U.S.C. 102(e) as being anticipated by Ishizuka (US Patent 6,617,801).

Regarding **claim 32**, Ishizuka discloses in FIG. 6 a display driver control circuitry for controlling a display driver for an electroluminescent display (11), the display comprising a plurality of electroluminescent display elements (E1,1-Em,n), the driver including a plurality of substantially constant current generators (21-2m) for simultaneously driving said plurality of display elements, each said constant current generator being configured for regulating the current on an associated display drive line (A1-Am) driving a set of said electroluminescent display elements, the display driver control circuitry comprising:

a drive voltage sensor (150) for sensing a voltage on a first line (A3) in which the current is regulated by said constant current generator; and

a voltage controller (151, 10) coupled to said drive voltage sensor for controlling the voltage of a supply (VA) for said constant current generator in response to said sensed voltage, and configured to control said supply voltage to increase the efficiency of said display driver (see column 9, lines 11-28),

wherein said voltage controller is configured to reduce said supply voltage when this will not substantially reduce said regulated current and/or said display brightness (see column 10, lines 9-20), and

said voltage controller is configured to control said supply voltage such that said constant current generator operates in the vicinity of its compliance limit (i.e. the

optimum voltage such that the EL elements are maintaining a steady light emitting condition), and

a system to dynamically determine said compliance limit (i.e. the voltage value required when the EL elements are maintaining a steady light emitting condition) for controlling said supply voltage (see column 10, lines 9-20).

Regarding **claim 34**, Ishizuka discloses in FIG. 6 a method of reducing the power consumption of a display driver driving an electroluminescent display (11), the display comprising a plurality of electroluminescent display elements (E1,1-Em,n), the driver including a plurality of substantially constant current generators (21-2m) for simultaneously driving said plurality of display elements, each said constant current generator being configured for regulating the current on an associated display drive line (A1-Am) driving a set of said electroluminescent display elements, the display having a power supply for supplying power at a supply voltage (Va) for said current generators, the method comprising:

sensing a voltage on each said display drive line coupled to each respective said current generator (see figure 11); and

controlling said supply voltage (VA) responsive to said sensed voltage to reduce said supply voltage when a reduction may be made without substantially altering said regulated current and such that said constant current generator operates in the vicinity of its compliance limit (i.e. the optimum voltage such that the EL elements are maintaining a steady light emitting condition, see column 10, lines 9-20) and

wherein said controlling comprises dynamically determining a said compliance limit (i.e. the voltage value required when the EL elements are maintaining a steady light-emitting condition) for controlling said supply voltage column 10, lines 9-20).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishizuka in view of Saller (US Patent 4,766,367).

Regarding **claim 31**, Ishizuka discloses in FIG. 6 a display driver control circuitry for controlling a display driver for an electroluminescent display (11), the display comprising a plurality of electroluminescent display elements (E1,1-Em,n), the driver including a plurality of substantially constant current generators (21-2m) for simultaneously driving said plurality of display elements, each said constant current generator being configured for regulating the current on an associated display drive line (A1-Am) driving a set of said electroluminescent display elements, the display driver control circuitry comprising:

a drive voltage sensor (150) for sensing a voltage on a first line (A3) in which the current is regulated by said constant current generator; and

a voltage controller (151, 10) coupled to said drive voltage sensor for controlling the voltage of a supply (VA) for said constant current generator in response to said

sensed voltage, and configured to control said supply voltage to increase the efficiency of said display driver (see column 9, lines 11-28),

wherein said voltage controller is configured to reduce said supply voltage when this will not substantially reduce said regulated current and/or said display brightness (see column 10, lines 9-20), and

said voltage controller is configured to control said supply voltage such that said constant current generator operates in the vicinity of its compliance limit (i.e. the optimum voltage such that the EL elements are maintaining a steady light emitting condition).

Ishizuka does not teach said constant current generator comprises a Wilson current mirror. However, Saller teaches using a Wilson current mirror as a constant current generator (see figure 3). It would have been obvious to one of ordinary skill in the art at the time of invention was made to use the Wilson current mirror as taught by Saller as the constant current generator of Ishizuka yielding the predictable result of providing constant current.

8. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishizuka in view of Nishitoba (US Publication 2002/0084812).

Regarding **claim 30**, Ishizuka discloses in FIG. 6 a display driver control circuitry for controlling a display driver for an electroluminescent display (11), the display comprising a plurality of electroluminescent display elements (E1,1-Em,n), the driver including a plurality of substantially constant current generators (21-2m) for

simultaneously driving said plurality of display elements, each said constant current generator being configured for regulating the current on an associated display drive line (A1-Am) driving a set of said electroluminescent display elements, the display driver control circuitry comprising:

a drive voltage sensor (150) for sensing a voltage on a first line (A3) in which the current is regulated by said constant current generator; and

a voltage controller (151, 10) coupled to said drive voltage sensor for controlling the voltage of a supply (VA) for said constant current generator in response to said sensed voltage, and configured to control said supply voltage to increase the efficiency of said display driver (see column 9, lines 11-28),

wherein said voltage controller is configured to reduce said supply voltage when this will not substantially reduce said regulated current and/or said display brightness (see column 10, lines 9-20), and

said voltage controller is configured to control said supply voltage such that said constant current generator operates in the vicinity of its compliance limit (i.e. the optimum voltage such that the EL elements are maintaining a steady light emitting condition).

Ishizuka does not teach the constant current generator comprises a bipolar transistor connected in series between a said drive line and a supply voltage line providing said supply voltage to said constant current generator, and wherein said bipolar transistor has an emitter terminal directly connected to said supply voltage line. However, Nishitoba teaches a constant current generator (figure 5) comprising a bipolar

transistor (Tr1) connected in series between a drive line (O1) and a supply voltage line (16) providing a supply voltage to said constant current generator, wherein the bipolar transistor has an emitter terminal directly connected to said supply voltage line (16). It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the constant current generator of Nishitoba instead of the constant current generator of Ishizuka, in order to reduce variation in brightness (see [0135]).

9. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishizuka in view of Morita (US Patent 6,509,854).

As to claim 33, Ishizuka teaches the system to dynamically determine a compliance limit of claim 32 but does not expressly teach a system to find a knee in a current voltage curve of said constant current generator. However, Morita teaches a constant current generator with a current voltage curve as shown in figure 3. The minimum voltage across the constant current generator (MOSFET) such that a substantially constant current will be produced is ~1V. Since Ishizuka teaches a system which provides the optimum anode power source voltage  $V_a$  to drive the EL elements with a constant current, one of ordinary skill in the art at the time the invention was made would recognize the system of Ishizuka is in fact finding a knee in a current voltage curve of the constant current generator, as shown by Morita, with the predictable result of providing constant current with a minimum supply voltage such that power losses are reduced.

***Response to Arguments***

10. Applicant's arguments with respect to claims 30-34 have been considered but are moot in view of the new ground(s) of rejection. The references of Ishizuka, Nishitoba, and Morita have been added for new grounds of rejection.

***Allowable Subject Matter***

11. Claims 1, 4, 5, 8-13, and 20-27 are allowed.

***Inquiry***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALLISON WALTHALL whose telephone number is (571)270-3571. The examiner can normally be reached on Mon - Fri 9:30-6:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chanh Nguyen can be reached on (571) 272-7772. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

anw  
December 15, 2009

/Chanh Nguyen/  
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